Dr Clémentine Bosch-Bouju

PhD in Neuroscience

Nutrineuro Lab
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Postdoctoral fellow in Neurophysiology

Current – postdoctoral fellow

2014-2016 Nutrineuro, UMR INRA 1286, University of Bordeaux (France)
Supervisor: Dr Sophie Layé
Postdoctoral project: I am studying how a diet deficient in Omega 3 fatty acids is impairing the synaptic plasticity, in relation to depression. I am focusing on the plasticity dependent on the endocannabionoid system and the role of inflammation
Main techniques: patch-clamp electrophysiological recordings, social defeat protocol

Research experience

2011-2013 Departement of Anatomy, University of Otago (Dunedin, New Zealand)
Supervisor: Dr Louise Parr-Brownlie
Post-doctoral project: I investigated the neuronal activity in the thalamus of control and parkinsonian rats during movement and I demonstrated how we can improve motor performance in parkinsonian rats by stimulating the basal ganglia input to the thalamus
Supervision: 1 post-graduate student, 1 postoctoral fellow, 1 technician,
Main techniques: electrophysiological recordings and optogenetic stimulations in freely moving rats, stereotaxic surgeries, confocal microscopy
2 collaboration projects with 1 local team and 1 international team

2008 - 2011 INSERM U667, CIRB, Collège de France (Paris, France)
Supervisor: Dr Laurent Venance
PhD project: I demonstrated one of the mechanisms of deep brain stimulation, a treatment for Parkinson's disease, and I developed a rat brain slice for the study of transmission and plasticity in the hyperdirect pathway of basal ganglia
Supervision : 2 post-graduate students, 1 technician
Main techniques: double patch-clamp, 3D anatomy, histology
3 collaboration projects with local teams

2007 - 2008 INSERM U667, CIRB, Collège de France (Paris, France)
Supervisors: Dr Laurent Venance & Prof Jean-Michel Deniau
Postgraduate project: I studied the synaptic interactions between output neurons in the striatum of transgenic D1-EGFP and D2-EGFP mice to better understand the neuronal coding in the striatum, a structure implicated in goal directed behaviour and associated disorders like depression and obsessive compulsive disorders
Main techniques: double patch-clamp, fluorescent microscopy

2007 (April – August) Fer à Moulin Institute (Paris, France)
Supervisors: Dr Emmanuel Valjent & Dr Jean-Antoine Girault
Undergraduate project: We demonstrated the impact of cocaine on MAP/Kinase pathway in output neurons in the striatum of transgenic D1-EGFP and D2-EGFP mice, to better understand mechanisms of cocaine addiction
Main techniques: Immunofluorescence, confocal microscopy

2006 (March - July) Bordeaux Institute of Neuroscience (Bordeaux, France)
Supervisors: Dr Agnès Nadjar & Dr Erwan Bezard
Summer student project: We studied the implication of MAP/Kinase pathway in basal ganglia in the development of dyskinesia induced by L-Dopa, a treatment for Parkinson's disease that lead to dramatic side effects after 5-10 years of treatment
Main techniques: Western Blot, cryostat

Teaching experience

2008 – 2011 Teaching at the UPMC University (Paris, France)

- Courses and training in general biology for undergraduate students (32h/year)
- Training in biochemistry for postgraduate students (32h/year)

Education

2008 - 2011	UPMC, Paris, France	PhD in Neuroscience with honours
2006 - 2008	UPMC, Paris, France	Master's Degree in Neuroscience with honours
2003 - 2006	University of Poitiers, France	Bachelor's Degree in Biology with honours
2003	High School of Civray, France	Scientific High School Diploma with honours

List of publications

- **Bosch-Bouju C**, Smither R, Hyland BI, Parr-Brownlie LC **(2013)** Reduced reach-related modulation of motor thalamus neural activity in a rat model of Parkinson's disease. Submitted.
- **Bosch-Bouju C**, Hyland BI, Parr-Brownlie LC **(2013)** Motor thalamus integration of cortical, cerebellar and basal ganglia information : implications for normal and parkinsonian conditions. ***Frontiers in Computational Neuroscience*** 7 :163.
- Nelson MJ, **Bosch C**, Venance L, Pouget P **(2013)** Microscale inhomogeneity of brain tissue distorts electrical signal propagation. ***Journal of Neuroscience*** 33, 2821-2828.
- **Bosch C**, Mailly P, Degos B, Deniau JM, Venance L **(2012)** Preservation of the hyperdirect pathway of basal ganglia in a rodent brain slice. ***Neuroscience*** 215, 31-41.
- **Bosch C**, Degos B, Deniau JM, Venance L **(2011)** Subthalamic nucleus high frequency stimulation generates a concomitant synaptic excitation-inhibition in substantia nigra *pars reticulata.* ***J Physiol*** 589:4189-4207.
- Deniau JM, Degos B, **Bosch C**, Maurice N **(2010)** Deep brain stimulation mechanisms: beyond the concept of local functional inhibition. ***Eur J Neurosci*** 32, 1080-1091.
- Bertran-Gonzalez J, **Bosch C**, Maroteaux M, Matamales M, Herve D, Valjent E, Girault JA **(2008)** Opposing patterns of signaling activation in dopamine D1 and D2 receptor-expressing striatal neurons in response to cocaine and haloperidol. ***Journal of Neuroscience*** 28, 5671-5685.

Fellowships, prizes and awards

- 2014-2016: **Agreenskills Fellowship**
- 2013: **First Prize** for the Research Staff Speaker Awards of the Otago School of Medical Science with the oral presentation: **Bosch-Bouju C**, Hyland BI, Parr-Brownlie LC. Movement-related neuronal activity in the motor thalamus is strongly impaired in a Parkinson's disease rat model.
- 2013: **Travel Fellowships** from the Neurological Foundation of New Zealand and from the IBAGS committee for attending the IBAGS XI meeting in Eilat (Israel) in March 2013
- 2011: **Travel Fellowship** from the French Neuroscience Society for attending the 10th French Neuroscience meeting in Marseille in May 2011

Posters in congress

- Little STC, **Bosch-Bouju C**, Parr-Brownlie LC **(2013)** Neuronal activity of reticular thalamic nucleus in urethane anesthetized rats. ***31th AWCBR***, Queenstown, August 2013
- **Bosch-Bouju C**, Hyland BI, Parr-Brownlie LC **(2013)** Reaching-related activity of motor thalamus in control and parkinsonian rats. **IBAGS XI**, Eilat, Mars 2013

- MJ Nelson, **Bosch C**, Venance L, Pouget P **(2012)** Electrical signal distortion in neural tissue on a microscale. ***42th Annual Meeting Neuroscience,*** New Orleans, October 2012
- **Bosch C**, Prier J, Hughes S, Hyland BI, Parr-Brownlie LC **(2012)** New light-activated protein constructs to dissect the function of GABAergic neurons in the brain. ***30th AWCBR***, Queenstown, August 2012
- **Bosch C**, Mailly P, Deniau J-M, Venance L **(2011)** Synaptic plasticity in the hyperdirect pathway of the basal ganglia. ***10th French Neuroscience Meeting***, Marseille, May 2011
- Degos B, **Bosch C**, Deniau J-M, Venance L **(2011)** Subthalamic nucleus high-frequency stimulation generates a concomitant synaptic excitation-inhibition in Substantia nigra pars reticulata. ***10th French Neuroscience Meeting***, Marseille, May 2011
- **Bosch C**, Degos B, Deniau JM & Venance L **(2010)** Inhibition-excitation competition underlies beneficial effects of subthalamic nucleus deep brain stimulation. ***40th Annual Meeting Neuroscience,*** San Diego, November 2010
- MJ Nelson, **Bosch C**, Venance L, Pouget P **(2010)** Microscale obstructions of electrical current flow in the brain. ***40th Annual Meeting Neuroscience,*** San Diego, November 2010
- **Bosch C**, Degos B, Deniau JM & Venance L **(2010)** Deep brain stimulation of the subthalamic nucleus decreases firing of substantia nigra pars reticulata neurons via a competition between glutamatergic subthalamonigral and GABAergic pallido-nigral inputs. ***7th FENS Forum***, Amsterdam, July 2010
- Bertran-Gonzalez J, **Bosch C**, Maroteaux M, Matamales M, Herve D, Valjent E, Girault JA **(2008)** Selective activation of signaling pathways in specific populations of striatal neurons in response to cocaine and haloperidol. ***38th Annual Meeting Neuroscience***, Washington, November 2008

Oral presentations

- **Bosch-Bouju C**, Prier J, Smither R, Hughes S, Hyland BI, Parr-Brownlie LC **(2013)** Optogenetic stimulation of basal ganglia inputs to motor thalamus affects reaching in parkinsonian rats. ***31th AWCBR***, Queenstown, August 2013
- **Bosch-Bouju C**, Hyland BI, Parr-Brownlie LC **(2013)** Reaching-related activity of motor thalamus in control and parkinsonian rats. Department of Anatomy, **University of Otago**, New Zealand, April 2013
- **Bosch-Bouju C**, Prier J, Smither R, Hughes S, Hyland BI, Parr-Brownlie LC **(2013)** Reaching-related activity of motor thalamus in control and parkinsonian rats. **Lyon Neuroscience Research Center**, Lyon, France, March 2013
- **Bosch C**, Mailly P, Deniau JM & Venance L **(2012)** Combining 3D anatomy and electrophysiology to study the hyperdirect pathway of basal ganglia. **NRG meeting**, University of Otago, New Zealand, August 2012
- **Bosch C**, Degos B, Mailly P, Deniau JM & Venance L **(2011)** Excitation-Inhibition balance in Substantia Nigra *pars reticulata* induces by Subthalamic Nucleus HFS. **Brain and Spine Institute,** Paris, France, June 2011
- **Bosch C**, Degos B, Mailly P, Deniau JM & Venance L **(2011)** Excitation-Inhibition balance in Substantia Nigra *pars reticulata* induces by Subthalamic Nucleus HFS. **Doctoral School congress,** Roscoff, France, April 2011
- **Bosch C**, Degos B, Mailly P, Deniau JM & Venance L **(2011)** Information processing in the hyperdirect pathway of basal ganglia. **Nutrineuro Laboratory**, Bordeaux, France, February 2011
- **Bosch C**, Degos B, Mailly P, Deniau JM & Venance L **(2010)** Information Processing in the Hyperdirect Pathway of Basal Ganglia. CIRB, **Collège de France**, Paris, France, October 2010
- **Bosch C**, Degos B, Deniau JM & Venance L **(2010)** High frequency stimulation of the subthalamuic nucleus: inhibition-excitation balance in the substantia nigra pars reticulata. ***Basal ganglia / movement disorders meeting***, Grenoble, France, Mars 2010

References

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